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09/531,531	03/21/2000	Yuichi Shirota	257718	7092

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EXAMINER

FORD, JOHN K

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.



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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

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Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents and Trademarks

Responsive to Communication Filed December 12, 2002

The enclosed is a correct copy of a reference relating to the last Office action. The correction is indicated below.

THE PERIOD FOR RESPONSE OF 3 MONTHS SET IN SAID OFFICE ACTION IS
RESTARTED TO BEGIN WITH THE DATE OF THIS LETTER.

☒ Part 1 - Correct Reference Citation

Newton (USP 2,728,206)

by

Mark H. ...
Reference Order Center

☒ Part 2 - Correct Reference Furnished:

Newton (USP 2,728,206)

by

Reference Order Center

enc.

Mark H. ...
Reference Order Center

Dec. 27, 1955

A. B. NEWTON ET AL

2,728,206

SYSTEM FOR HANDLING CONDENSATE

Filed Nov. 23, 1951

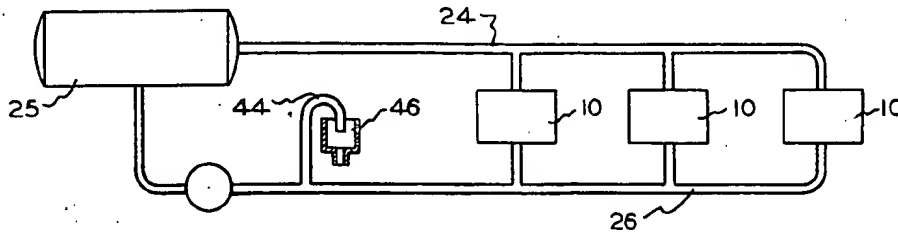


FIG. III.

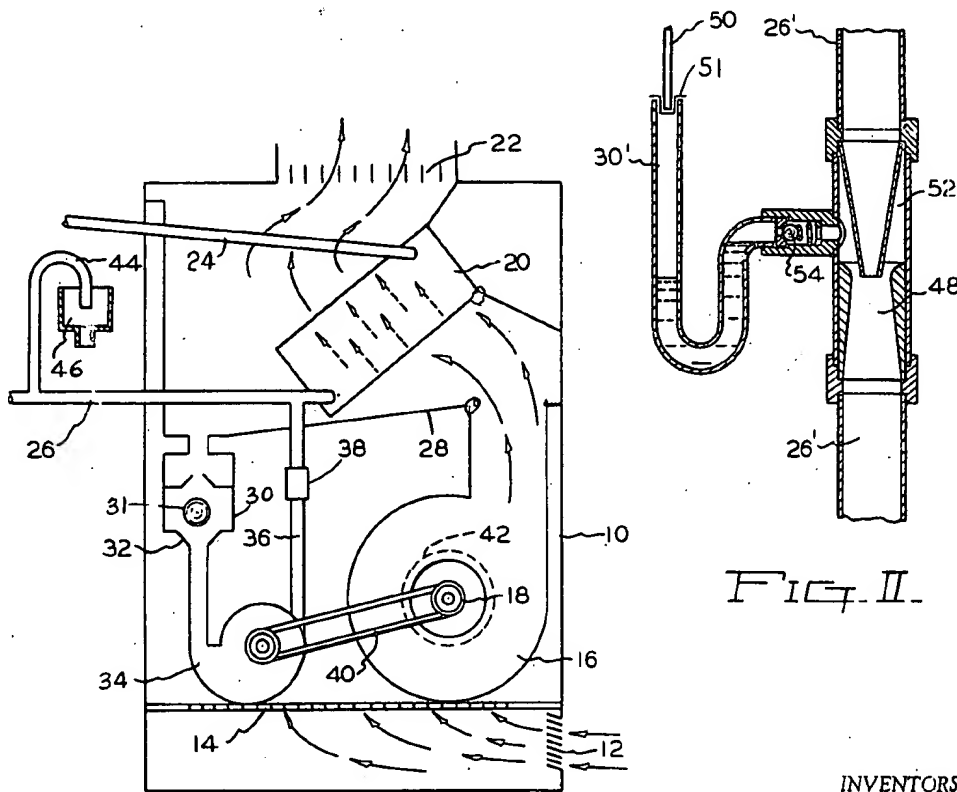


FIG. II.

INVENTORS

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FIG. I.

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2,728,206

SYSTEM FOR HANDLING CONDENSATE

Alwin B. Newton and Ronald S. Drake, Jackson, Mich.,
assignors to Acme Industries, Inc., Jackson, Mich., a
corporation of Michigan

Application November 23, 1951, Serial No. 257,856

1 Claim. (Cl. 62-140)

The present invention relates to improvements in a system for the automatic return of condensate, preferably from a plurality of air conditioning units, or similar apparatus, through which chilled water is being circulated and resulting in condensation being formed.

It has been the practice in the handling of condensate from individual room air conditioning units to either pipe each unit to a sewer connection or to provide each unit with a receptacle into which the condensate is directed and accumulated and then periodically emptied.

According to the present invention, the condensate from each air conditioning unit is preferably discharged into the circulating system for the chilled water. This avoids a sewer connection for each unit, reduces piping to a minimum and permits the use of the condensate for make-up water. It is immaterial, according to the present invention, whether the condensate is being discharged into the chilled water line flowing to or returning from the air conditioning unit.

One of the objects of the invention is to provide a system of handling condensate in an air conditioning system in which the condensate is discharged into the chilled water circulating system.

Another object is to provide a system of condensate handling in air conditioning and other similar apparatus in which the condensate is periodically and automatically discharged into the circulating system of the chilled water.

These and other objects and advantages residing in the construction, combination and arrangement of parts and the resulting system will more fully appear from a consideration of the following specification with the appended claim.

In the drawings,

Fig. I is a schematic drawing of an air conditioning unit embodying one form of the present invention,

Fig. II is a view similar to Fig. I of another form of the invention, and

Fig. III is a schematic drawing of a system involving the present invention.

Referring to Fig. I, the air conditioning unit 10 has an air inlet 12 from which the entering air passes up through the filter 14. The fan 16 has a suitable drive shaft 18 upon which the fan elements are mounted. After leaving the fan 16, the air passes through the coil 20 and leaves the unit 10 by the outlet 22.

Chilled water flows to the coil 20 through the pipe 24 and it is returned to the water chiller 25 by the return pipe 26.

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Condensate formed upon the coil 20 drips into the inclined pan 28 and runs into the accumulator 30. A ball or other suitable valve causes the condensate to collect in the accumulator 30 until the ball is floated from the seat 32 whereupon the pump 34 discharges the condensate from the accumulator 30 into the chilled water return line 26, through the line 36 and past the check valve 38. As shown, the pump 34 is driven by a belt 40 passing over a suitable pulley on the drive shaft 18. A suitable electric motor 42 directly connected to the shaft 18 and located on the back side of the fan 16 functions to drive both the fan 16 and the pump 34.

The condensate discharged into the chilled water return line 26 will supply any make-up water required. Any surplus will be elevated in the stand pipe 44 and discharged into the drain 46 which is preferably common to all the units 10 of the system.

In the form shown in Fig. II, a venturi 48 in the chilled water return line 26' performs the function of the pump 30 of Fig. I. Condensate from the unit 10 is discharged by the line 50 into the screen 52 in the upper end of the U-shaped stand pipe accumulator and trap 30'. The reduced pressure produced by the venturi 48 at 52 will maintain the liquid levels indicated to seal against the entrance of air into the return line 26'. The sensitive ball valve 54 permits the flow of condensate into the line 26' as it flows into the accumulator 30' yet prevents leakage which might result from a back pressure.

It is anticipated that the principles of the invention have application to refrigerating systems in which the cooling medium is other than chilled water. With a medium of a different substance than water, separation of the condensate from the cooling medium would be necessary at a central point.

Having thus described our invention, what we wish to claim as new and desire to cover by Letters Patent is:

A chilled water air conditioning apparatus comprising a cabinet, a body of cooling coils disposed in said cabinet, inlet and return conduits for conducting the chilled water to and from said coils, said body being inclined downwardly from one side of said cabinet toward the other side of said cabinet, means located below said body adjacent said other side of said cabinet for gathering condensate dripping from said coils, a valved accumulator disposed below said means, a pump having inlet connection with said accumulator disposed below said accumulator adjacent said other side of said cabinet and having a driven shaft, an outlet connection extending from said pump and discharging condensate into one of said conduits, an air circulating fan disposed in a lower portion of said cabinet adjacent said one side thereof and beside said pump and having a driven shaft parallel to said pump shaft, and a drive belt drivingly interconnecting said fan shaft and pump shaft.

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